Reducing Risk with Food Thermometers: Strategies for Behavior Change

- Joint Washington State University (WSU)/University of Idaho (UI) project; $374,191
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Object: Motivate and educate consumers to use food thermometers

For ground beef patties, color is not an indicator of end-point temperature.

Safe: has reached 160ºF

Unsafe: has not reached 160ºF

1 out of every 4 burgers turns brown before reaching a safe temperature. *Lyon and Berry, 2000.*

6% of consumers use a thermometer when cooking hamburgers. *Research Triangle Institute, 2002.*

Focus on food thermometers useful for measuring small meat items

Dial instant-read thermometer

Digital instant-read thermometer

7 project steps:

- Assess thermometer availability/reliability
- Assess accuracy of cooking recommendations
- Use focus groups to assess barriers
- Develop Stages of Change instrument
- Develop educational/motivational materials
- Test effectiveness
- Deliver information to consumers

Step 1. Assess availability, accuracy and response time of food thermometers

- Stores: department, grocery, kitchen specialty, hardware, drug/variety, 22 internet retailers.
- Information recorded: type, features, brand, model, instructions, price
- Conducted: Oct 2001-May 2002

Stores with thermometers:

Store	# surveyed	% Stores w/ Thermo-meters	# Stores w/ Digital/Dial	# Stores w/ none
Department	42	76%	27/28	10
Grocery	40	73%	14/27	11
Specialty	25	88%	17/19	3
Hardware	18	33%	4/5	12
Drug/variety	13	54%	1/7	6
Total	**138**		**63/86**	**42**

Collected information on models, brands & prices for 237 thermometers.

Assess thermometer accuracy and response time

13 Digital models

8 Dial models

Water bath at 160ºF

Thermometers were accurate and variable in response time

- All but one of the 57 thermometers measured the 160°F temperature within 2°F.
- Time to go from RT to 160°F was 10 to 31 seconds
    - Dial: 16 – 25 seconds (average 21)
    - Digital: 10 – 31 seconds (average 18 seconds)

Step 2. Assess accuracy of cooking recommendations

Inoculated hamburger was cooked using three methods:

- in a frying pan, with the patty turned once
- in a frying pan, with the patty turned every 30 seconds
- in a double-sided (clam-shell) grill

Inactivation of *E. coli* O157:H7 in hamburger cooked to 160°F (71.1°C) was determined.

Findings…

Cooking Method	Time to 160°F	*E. coli* O157:H7 Reduction
Double-sided grill	2.7 min	6.9 $\log_{10}$ CFU/g
Single-side; turned every 30 s	6.6 min	5.6 $\log_{10}$ CFU/g
Single-side; patty turned once	10.9 min	4.7 $\log_{10}$ CFU/g

The double-sided grill was more effective ($P < 0.01$) in destroying *E. coli* O157:H7 in hamburger.

Assess thermometer cleaning methods

- Inserted thermometer stems into inoculated ground beef, then cleaned by wiping, rinsing and wiping + rinsing.
- The two-step methods of rinsing with 50ºC water or 70% ethanol, then wiping with a towel or wipe was effective.

Step 3. Use focus groups to assess barriers

Cooking and using dial and digital instant read food thermometers

Discussing food thermometers

Selected group responses

What did you think about using a thermometer?

- Many = food thermometer revealed they were overcooking, few noted undercooking.
- “Felt good” to know meat was safely cooked.

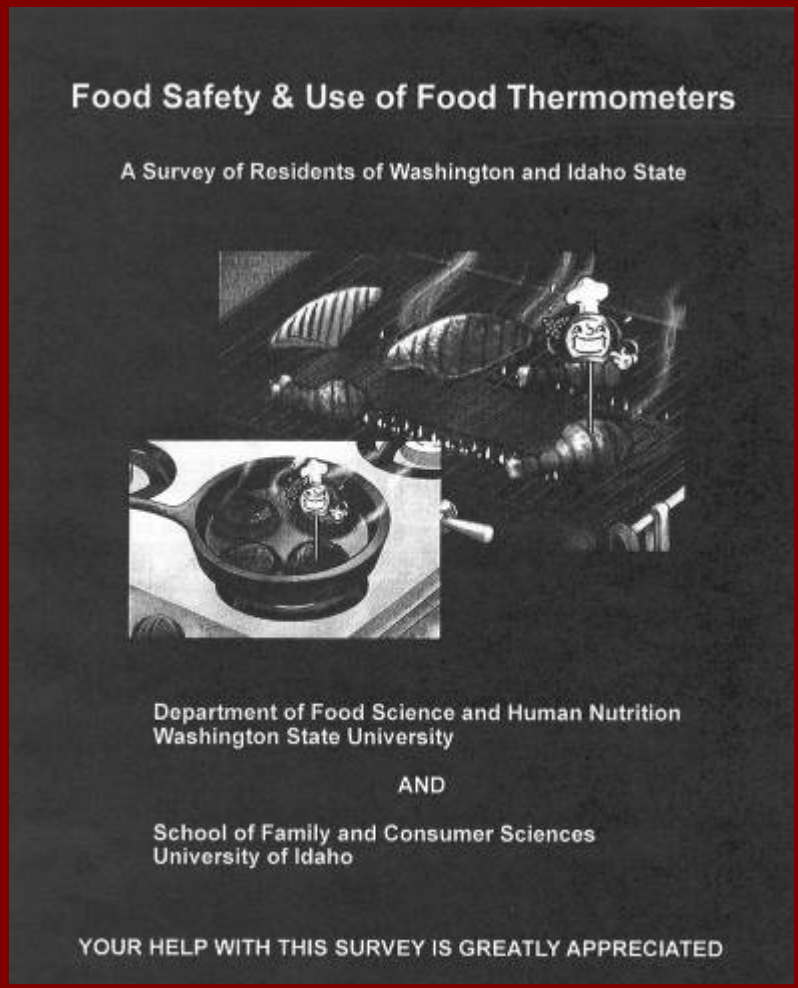
What would keep you from using?

- Lack of time, forgetfulness and laziness.
- Inconvenient.
- Not comfortable using the thermometer.

What would motivate?

- Avoidance of foodborne illness, especially re children or elderly persons .
- Improved meat quality.

Step 4. Develop Stages of Change Questionnaire for Thermometer Use



Step 5. Develop educational/motivational materials

Now You're Cooking…Using a Food Thermometer

Transtheoretical Model (Stages of Change) and the Health Belief Model used to develop:

- Brochure
- Recipe cards
- Video
- Curriculum kit

Back of recipe card:

Now you're cooking...

Be a better cook—It is easy to overcook pork chops, burgers, sausage patties and chicken breasts, making them dry and tasteless. Use a food thermometer to test for doneness for a juicy, flavorful piece of meat.

Be a safer cook—Color, time and texture do not indicate if small cuts of meat are cooked to a safe temperature. Using a food thermometer is the only way to be sure pork chops, burgers, sausage patties and chicken breasts are cooked to a safe temperature.

Perfect—Use a food thermometer you prepare pork chops, patties and chicken breasts. g new skills and developing time!

ood thermometer!

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WASHINGTON STATE UNIVERSITY
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- An **Instant-Read Dial Thermometer** reads the temperature along 2–3″ of the probe—this means 2–3″ of the probe must be inside the food.
- An **Instant-Read Digital Thermometer** has its temperature sensor in the tip. The probe must be inserted at least 1/2-inch into the food.

An *Instant-Read Dial Thermometer* has a 2–3″ sensing area

An *Instant-Read Digital Thermometer* has a 1/2″ sensing area

Quick and Easy Steps to Check Temperature:

- **Step 1**—For thin meat, insert the probe into the side of the meat.
- **Step 2**—Insert the probe so at least 2–3″ (dial) or 1/2-inch (digital) is in the center of the meat.
- **Step 3**—Allow 15–20 seconds for the temperature to stabilize.

Inside of brochure

Step 6. Did the materials work?

Consumer classification for Stage of Change for thermometer use

	Pre- (n=295)	Post-
Pre-contemplation	80%	46%
Contemplation	8%	12%
Preparation	3%	7%
Action	1%	18%
Maintenance	8%	16%

Consumer use of food thermometers for small cuts of meat

Never use	85%	48%
Regularly use	4%	16%

Step 7. Deliver information to consumers

- “Use a Thermometer” campaign with grocery store partners.
- Developed rack cards with main messages from brochure

Stauffers of Kissel Hill, PA

Coordinates and supplements USDA's Thermy™ and "Is it *done* yet?" Campaigns